



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Wildlife Management/Realty Offices  
6578 Dogwood View Parkway, Suite B  
Jackson, Mississippi 39213

June 22, 1999

Dr. Vic Nettles  
Southeastern Cooperative Wildlife Disease Study  
College of Veterinary Medicine  
University of Georgia  
Athens, GA 30602739

Dear Vic,

We would like to request deer herd health checks in late summer or early fall on Bayou Cocodrie NWR, St. Catherine Creek NWR, and Lake Ophelia NWR. It has been some time since we have had health checks on these refuges and all have had either significant additions or habitat changes since their last health check. Potential changes in harvest regulations also add to our need for more herd health information. Last year we tried to schedule a check at Bayou Cocodrie, but were unable to arrange it because your personnel had other commitments.

All three refuges are relatively close to each other and at least two of them have coolers. I would not anticipate any problem collecting the deer since there are ample fields and good road access. If you are in a time bind you could drop Lake Ophelia, but all three really need to be checked. We are in the middle of comprehensive planning at all three so it adds an extra need.

Your consideration of this request is appreciated. If we can be of further assistance please call me.

cc: Jim Hall  
Jerome Ford  
Denis Sharp

Sincerely yours,

S. Ray Aycock  
Supv. Wildlife Mgmt. Biologist

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ALABAMA  
ARKANSAS  
FLORIDA  
GEORGIA  
KENTUCKY  
LOUISIANA  
MARYLAND  
MISSISSIPPI  
MISSOURI  
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PUERTO RICO  
SOUTH CAROLINA  
TENNESSEE  
VIRGINIA  
WEST VIRGINIA

# SOUTHEASTERN COOPERATIVE WILDLIFE DISEASE STUDY



COLLEGE OF VETERINARY MEDICINE  
THE UNIVERSITY OF GEORGIA  
ATHENS, GEORGIA 30602-7393

December 21, 1999

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Mr. Jim Hall  
St. Catherine's Creek National  
Wildlife Refuge  
P.O. Box 117  
Sibley, Mississippi 39165

Dear Mr. Hall,

Enclosed is our report on the deer herd health checks conducted on St. Catherine's Creek National Wildlife Refuge, Adams County, Mississippi on September 20, 1999. The health check involved examination of five deer. The data are arranged into a series of tables (parasitologic, serologic, and pathologic) and are accompanied by interpretive comments.

The interpretive comments focus on the current and future probabilities of problems due to the two major disease problems of southeastern deer: 1) a syndrome of parasitism and malnutrition which generally tends to be density dependent, and 2) hemorrhagic disease which is less clearly linked to deer density. The data indicate that the population is experiencing a syndrome of parasitism/malnutrition which is a common herd health problem where deer density exceeds nutritional carrying capacity. Evidence for this conclusion includes the high APC value, the diversity and frequency of pathologic conditions, and the poor to marginal health status of the majority of the animals examined. The population also has recently experienced an episode of EHD virus infection, and although the impact of that prior infection cannot be ascertained from serologic data, the positive aspect is that for the next couple of years the herd should have little risk of EHD-related mortality. Continuation of current herd density will lead to further declines in herd health and higher levels of disease induced mortality.

We trust this information will be of value in management of this deer herd. Information on the parasites and diseases covered in this report can be obtained from the text Diseases and Parasites of White-tailed Deer; pages 413-423 discuss the relationships between deer density, nutrition, and disease. If you have any questions about the reports, please contact me.

Sincerely,

*Randy Davidson*  
William R. Davidson, Ph.D  
Professor

Enclosures

CC: Mr. Ray Aycock  
Mr. C. Robert Cooke, Jr.  
Dr. E. Frank Bowers  
Mr. Bill Thomason

Table 1. Arthropod, helminth, and protozoan parasites of five white-tailed deer (*Odocoileus virginianus*) collected from St. Catherine's Creek National Wildlife Refuge, Adams County, Mississippi, on September 20, 1999.

ARTHROPODS											
<u>Animal Number</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>Animal Number</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Age (years)	3.5	1.5	7.5	1.0	2.5	Lice	-	-	-	-	-
Sex	F	F	F	F	M	Louse Flies	-	Light	Moder.	Light	Light
Weight (pounds)	122	110	112	88	165	Ticks	-	-	Light	Light	-
Physical Condition	Fair	Fair	Poor	Fair	Good	Chiggers	-	-	-	-	-
Kidney Fat Index	5.7	29.1	5.1	30.2	49.0	Ear Mites	-	-	-	-	-
Packed Cell Volume	44	57	39	54	48	Nasal Bots	Moder.	Light	-	Light	Light

Number of Parasites Per Deer										
<u>Location in Host</u>	<u>HELMINTHS</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>Range</u>	<u>Prevalence</u>	<u>Average</u>	
Subcutaneous										
Muscle	<i>Parelaphostrongylus andersoni</i>	-	-	-	+	-	-	20%	-	
Brain										
Circulatory										
Thoracic Cavity	<i>Setaria yehi</i>	-	-	-	1	-	0-1	20%	0.2	
Lungs	<i>Dictyocaulus viviparus</i>	5	-	10	4	-	0-10	60%	3.8	
	Protostrongylid larvae	-	+	-	+	-	-	40%	-	
Abdominal Cavity	<i>Setaria yehi</i>	-	1	-	3	-	0-3	40%	0.8	
Liver	<i>Fascioloides magna</i>	-	-	9	-	-	0-9	20%	1.8	
Esophagus	<i>Gongylonema pulchrum</i>	-	-	15	-	-	0-15	20%	3.0	
Rumen										
Abomasum	<i>Mazmastrongylus odocoilei</i>	4,720	810	2,883	545	1,013	545-2,883	100%	1,994.2	
APC = (2,780)	<i>Ostertagia dikmansii</i>	215	-	251	-	-	0-251	40%	93.2	
	<i>Ostertagia mossi</i>	2,145	232	501	293	-	0-501	80%	634.2	
	<i>Trichostrongylus axei</i>	-	58	125	421	67	0-125	80%	58.4	

#### PROTOZOANS

Blood	<i>Theileria cervi</i>	+	+	-	-	-	-	40%	-
	<i>Trypanosoma cervi</i>	+	+	+	+	-	-	80%	-

Table 2. Results of serologic tests for selected diseases in five white-tailed deer from St. Catherine's Creek National Wildlife Refuge, Adams County, Mississippi, on September 20, 1999.

DISEASE	DEER NUMBER				
	1	2	3	4	5
Leptospirosis					
(serotype <u>bratislava</u> )	Neg	Neg	Neg	Neg	Neg
(serotype <u>pomona</u> )	Neg	Neg	Neg	Neg	Neg
(serotype <u>hardjo</u> )	Neg	Neg	Neg	Pos	Pos
(serotype <u>grippotyphosa</u> )	Neg	Neg	Neg	Neg	Neg
(serotype <u>icterohemorrhagiae</u> )	Neg	Neg	Neg	Neg	Neg
(serotype <u>canicola</u> )	Neg	Neg	Neg	Neg	Neg
Brucellosis	Neg	Neg	Neg	Neg	Neg
Infectious bovine rhinotracheitis (IBR)	Neg	Neg	Neg	Neg	Neg
Bovine virus diarrhea (BVD)	Neg	Neg	Neg	Neg	Neg
Parainfluenza <sub>3</sub> (PI <sub>3</sub> )	Neg	Neg	Neg	Neg	Neg
Epizootic hemorrhagic disease (EHD)	Wk+	Neg	Pos	Pos	Pos
Bluetongue (BT)	Neg	Neg	Wk+	Wk+	Wk+
Johne's Disease	Neg	Neg	Neg	Neg	Neg

Table 3. Lesions and pathologic conditions in five white-tailed deer collected from St. Catherine's Creek National Wildlife Refuge, Adams County, Mississippi, on September 20, 1999.

LESION/CONDITION	DEER NUMBER				
	1	2	3	4	5
Bronchitis/peribronchitis	-	1	1	-	-
Fibrinous pleuritis	1	-	-	2	2
Pneumonitis	-	-	-	1	-
Fibrinous peritonitis	-	-	-	-	1
Focal hepatic fibrosis	-	-	2	-	-
Infectious cutaneous fibromas	-	-	-	1	-
Lymphadenopathy	1	-	1	-	-
Polycystic nephritis	-	-	2	-	-
Emaciation	-	-	1	-	-
Anemia	-	-	1	-	-

\*Key: - = lesion or condition not present; 1 = minor tissue damage or mild pathologic change; 2 = moderate tissue damage or moderate pathologic change; 3 = extensive tissue damage or marked pathologic change.

INTERPRETIVE COMMENTS: White-tailed deer collected from St. Catherines Creek National Wildlife Refuge, Adams County, Mississippi, on September 20, 1999.

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Muscleworms (*Parelaphostrongylus andersoni*) present in at least one animal but adult stages of this parasite are not considered pathogenic. Large lungworms (*Dictyocaulus viviparus*) present at low to moderate numbers in three deer. Protostrongylid larvae, from muscleworms (*Parelaphostrongylus andersoni*), present in two animals. Large lungworms and protostrongylid larvae associated with mild to moderate lung damage (peribronchitis, pleuritis, pneumonitis) in all five deer. Abomasal parasites (*Mazamastrongylus odocoilei*, *Ostertagia dikmansi*, *O. mossi*, *Trichostrongylus axei*) at a high level (APC = 2,780) indicating that the herd has a very high probability of exceeding nutritional carrying capacity. Liver flukes (*Fascioloides magna*) present at a moderate level in one deer and associated with moderate liver damage (hepatic fibrosis) in that animal. Abdominal worms (*Setaria yehi*) and gullet worms (*Gongylonema pulcrum*) each present in single animals but not considered important to herd health at the levels encountered. Blood protozoans (*Trypanosoma cervi* and *Theileria cervi*) present with the latter considered to be a stressor in malnourished or heavily parasitized animals. Arthropod parasites (louse flies, ticks, nasal bots) at levels typical of many deer herds in the Southeast.

Physical condition ratings, kidney fat indices, body weights, and hematologic values were variable; one aged animal (No. 3) was in poor overall health with slight emaciation and mild anemia. In addition to lesions attributable to parasitism (noted above), pathologic studies disclosed viral skin tumors (fibromas) in one deer, nonspecific inflammation of the lymph nodes (lymphadenopathy) in two deer, and multiple kidney cysts (polycystic nephritis) in one deer. The poor health of Deer No. 3 with multiple lesions/pathologic conditions may have been related in part to advanced age. Serologic tests for antibodies to selected infectious diseases disclosed antibodies to the *hardjo* serovar of *Leptospira interrogans* in two deer and antibodies to EHD and bluetongue viruses in four and three animals respectively. Antibodies to leptospires are detected occasionally among white-tailed deer but leptospirosis is rare among deer and not considered an important herd health problem. EHD and bluetongue viruses are the cause of hemorrhagic disease which is the most important infectious disease of deer in the Southeast. The weak reactions to bluetongue virus probably represent cross-reactions resulting from prior infection with EHD virus. The high prevalence of EHD antibodies indicates the population experienced a high level of viral activity within the past 2-3 years and that currently there is a high level of herd immunity to EHD virus. Accurate population-specific prediction of future activity by hemorrhagic disease viruses is currently not possible but risk of EHD-related mortality should be low for 2-3 years. The remaining serologic tests were uniformly negative indicating minimal activity by these diseases within the population.

An overview is as follows: (1) based on APC data the herd exceeds nutritional carrying capacity; (2) the presence of important pathogenic parasites such as large lungworms, liver flukes, ticks, and blood protozoans are reason for concern; (3) the population currently has a high degree of herd immunity to EHD virus and risk of this disease for the near future should be low; (4) other viral and bacterial diseases have not had high levels of activity on the area; and (5) the overall health status of the herd presently is such that some disease-related mortality probably is occurring. Based on this herd health data, consideration should be given to a plan to bring the herd more in line with carrying capacity. Continuation of current herd density can be expected to result in further declines in herd health and higher rates of disease-induced mortality.



# St. Catherine Creek National Wildlife Refuge

**ADDRESS:** P.O. Box 117, Sibley, MS 39165

**PHONE:** (601) 442-6696

**DIRECTIONS TO REFUGE:** 10 miles south of Natchez on Highway 61 South right on York Road, 2 miles to Refuge entrance left on Pintail Lane. Refuge headquarters is approximately 1/2 mile on right.

**ENDANGERED & THREATENED SPECIES ON THE REFUGE:** Bald Eagle, peregrine falcon, wood storks, interior least tern, big eared bat, black bear.

**OTHER WILDLIFE SPECIES:** Various shorebirds, wading birds, Bald eagle, ducks (most common; mallard, green and blue winged teal, pintail, wood duck, northern shoveler), Mississippi kite, hawks, woodpeckers, hummingbird, wild turkey, owls, various neotropical migrants, black bear, white tailed deer, river otter, bobcat, beaver, armadillo, American alligator, box and water turtles, canebrake rattlesnake, cottonmouth.

**HABITAT DESCRIPTION:** Habitat within St. Catherine Creek National Wildlife Refuge offers a myriad of ecological niches for wildlife. Cypress swamps and hardwood forests teaming with oak, gum, elm, ash, and cottonwood comprise 30 percent of the Refuge. Ten percent of the acreage is open water, while the remaining area consists of cleared land and land created due to the meandering of the Mississippi River. Rains and backwater flooding fill depressions and basins in low areas creating optimum wintering ground for waterfowl as well as unique habitat for other forms of wildlife. Natural water bodies and a multitude of beaver ponds create ideal habitat for summer nesting wood ducks.

**FOCUS ACTIVITIES:** One of the primary objectives of St. Catherine Creek National Wildlife Refuge is to enhance the potential of the refuge's wetland areas to support migrating and wintering waterfowl. Presently, the refuge floods via backwater from St. Catherine Creek and the Mississippi River. However, when the backwater recedes to within the banks of the creek, many acres of potential wetland habitat are no longer available. Refuge management efforts include installing water control structures, culverts, and improving a levee/road system which will retain backwater for those periods when areas may otherwise become dry. Several of the low sites retaining water are managed for production of moist soil vegetation such as smartweed, common millet, sprangletop and rushes, while other areas of the refuge are cooperatively managed for agricultural crop production. The farmers with cooperative agreements are required to leave a portion of the crop unharvested. The combination of natural and agricultural foods available helps accommodate the nutritional and energetic requirements of wintering waterfowl and other wildlife using the refuge. Management plans include lowering water levels in waterfowl impoundments in the spring to provide feeding and resting areas for shorebirds and other migrant species. Current refuge management strategies aim to restore major portions of the refuge with several hardwood species including oaks and bald cypress that grew native before man's intervention. Reforestation efforts will enhance wildlife diversity as well as prevent loss of valuable soil as a result of wind and backwater flooding from seasonal fluctuations of the Mississippi River.

**OPPORTUNITIES FOR PUBLIC USE:** The public is welcome to visit the refuge year round. There is something for everyone to enjoy; fishing, hunting, nature observation, and hiking. You are encouraged to stop at the refuge headquarters. A Nature Trail is available near the headquarters where a variety of wildlife may be observed. Public hunting is available during the state seasons (permits required). Fishing is permitted from March 1st through September 15th.